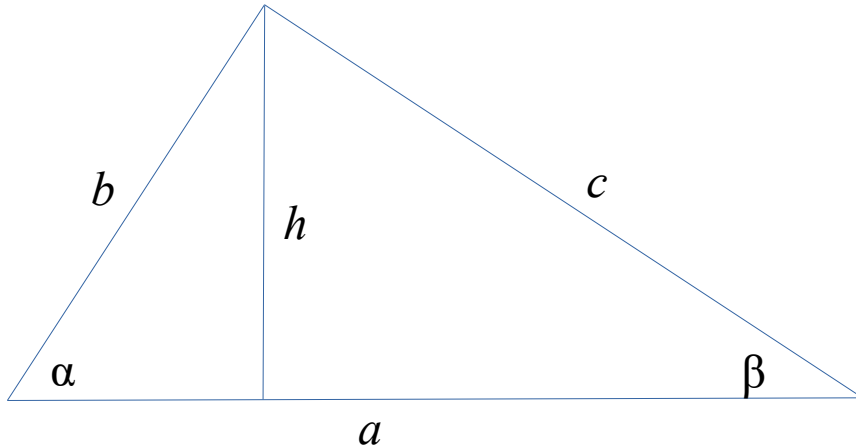


Pythagoras' Theorem proved yet again

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I was just speculating on a Sunday afternoon on using the sine rule for a right angled triangle area to prove Pythagoras' Theorem and it popped out just like this:



$$A = \frac{1}{2}ah = \frac{1}{2}ab \sin \alpha = \frac{1}{2}ac \sin \beta.$$

$$M_1 = \frac{1}{2}bh \sin \beta,$$

$$M_2 = \frac{1}{2}ch \sin \alpha.$$

$$A = M_1 + M_2.$$

$$h = \frac{2A}{a}, \quad \sin \alpha = \frac{2A}{ab}, \quad \sin \beta = \frac{2A}{ac}.$$

$$M_1 = \frac{2A^2b}{a^2c},$$

$$M_2 = \frac{2A^2c}{a^2b}.$$

$$A = \frac{2A^2b}{a^2c} + \frac{2A^2c}{a^2b} \Rightarrow a^2 \frac{cb}{2} = b^2A + c^2A.$$

$$\text{But } A = \frac{cb}{2} \therefore a^2 = b^2 + c^2.$$

The speculation is that someone has already done the proof this way but I'd rather try myself than look through the 400 hundred or so attempts by other people for it.